WHAT IS CLAIMED:

1. An emissive polymer layer, comprising:

a plurality of host components; and

at least one of: (1) a plurality of electron traps, (2) a plurality of hole traps, and (3) a plurality of electron/hole traps,

wherein said plurality of electron traps reduce electron mobility within said emissive polymer layer, said plurality of hole traps reduce hole mobility within said emissive polymer layer, and said plurality of electron/hole traps reduce electron mobility and hole mobility within said emissive polymer layer.

2. The emissive polymer layer of claim 1 wherein an energy barrier to trap electrons between a LUMO level of said plurality of host components and a LUMO level of said plurality of electron traps is large enough to reduce electron mobility, and an energy barrier to trap holes between a HOMO level of said plurality of host components and a HOMO level of said plurality of electron traps is small enough so that hole mobility is not significantly reduced.

3. The emissive polymer layer of claim 2 wherein said energy barrier to trap electrons between said LUMO level of said plurality of host components and said LUMO level of said plurality of electron traps is at least a thermal energy, and said energy barrier to trap holes between said HOMO level of said plurality of host components and said HOMO level of said plurality of electron traps is less than said thermal energy.

4. The emissive polymer layer of claim 2 wherein visible light is emitted from said emissive polymer layer, said visible light primarily due to recombinations at said plurality of host components.

5. The emissive polymer layer of claim 1 wherein an energy barrier to trap holes between a HOMO level of said plurality of host components and a HOMO level of said plurality of hole traps is large enough to reduce hole mobility, and an energy

barrier to trap electrons between a LUMO level of said plurality of host components and a LUMO level of said plurality of hole traps is small enough so that electron mobility is not significantly reduced.

6. The emissive polymer layer of claim 5 wherein said energy barrier to trap holes between said HOMO level of said plurality of host components and said HOMO level of said plurality of hole traps is at least a thermal energy, and said energy barrier to trap electrons between said LUMO level of said plurality of host components and said LUMO level of said plurality of hole traps is less than said thermal energy.

7. The emissive polymer layer of claim 5 wherein visible light is emitted from said layer, said visible light is primarily due to recombinations at said plurality of host components.

8. The emissive polymer layer of claim 1 wherein

an energy barrier to trap holes between a HOMO level of said plurality of host components and a HOMO level of said plurality of electron/hole traps is large enough to reduce hole mobility, and

an energy barrier to trap electrons between a LUMO level of said plurality of host components and a LUMO level of said plurality of electron/hole traps is large enough to reduce electron mobility.

9. The emissive polymer layer of claim 8 wherein

said energy barrier to trap holes between said HOMO level of said plurality of host components and said HOMO level of said plurality of electron/hole traps is at least a thermal energy, and

said energy barrier to trap electrons between said LUMO level of said plurality of host components and said LUMO level of said plurality of electron/hole traps is at least said thermal energy.

10. The emissive polymer layer of claim 9 wherein

said energy barrier to trap holes substantially differs from said energy barrier to trap electrons.

11. The emissive polymer layer of claim 9 wherein

said energy barrier to trap holes is approximately equal to said energy barrier to trap electrons.

12. The emissive polymer layer of claim 8 wherein visible light is emitted from said emissive polymer layer, wherein at least some of said visible light is due to recombinations at said plurality of electron/hole traps.

13. The emissive polymer layer of claim 1 wherein

a density of said plurality of electron traps is high enough to reduce electron mobility,

a density of said plurality of hole traps is high enough to reduce hole mobility, and

a density of said plurality of electron/hole traps is high enough to reduce electron mobility and hole mobility.

14. The emissive polymer layer of claim 13 wherein

said density of said plurality of electron traps is less than ten mole percent of said emissive polymer layer,

said density of said plurality of hole traps is less than ten mole percent of said emissive polymer layer, and

said density of said plurality of electron/hole traps is less than ten mole percent of said emissive polymer layer.

15. A method to form an emissive polymer layer, comprising:

adding a plurality of traps to a plurality of host components of said emissive polymer layer to reduce any one of: (1) hole mobility of said emissive polymer layer, (2) electron mobility of said emissive polymer layer, or (3) hole mobility of said emissive polymer layer and electron mobility of said emissive polymer layer.

16. The method of claim 15 wherein adding said plurality of traps includes

chemically bonding different portions of said plurality of traps to different portions of said plurality of host components, or

mixing a plurality of trap chains with a plurality of host polymer chains,

wherein each of said plurality of host polymer chains is a different portion of said plurality of host components and each of said plurality of trap chains is a different portion of said plurality of traps.

17. The method of claim 15 wherein said plurality of traps are any one of:

(1) a plurality of hole traps that reduce hole mobility of said emissive polymer layer,

(2) a plurality of electron traps that reduce electron mobility of said emissive polymer layer, or

(3) a plurality of electron/hole traps that reduce hole mobility of said emissive polymer layer and electron mobility of said emissive polymer layer.

18. The method of claim 17 wherein

said plurality of hole traps do not significantly reduce electron mobility of said emissive polymer layer, and

said plurality of electron traps do not significantly reduce hole mobility of said emissive polymer layer.

19. A method to increase at least one of: efficiency and lifetime of an OLED device, comprising:

trapping, within an emissive polymer layer, at least one of: (1) a portion of a plurality of electrons, and (2) a portion of a plurality of holes; and

reducing at least one of: (1) electron mobility of said emissive polymer layer by trapping said portion of electrons, and (2) hole mobility of said emissive polymer layer by trapping said portion of holes.

20. The method of claim 19 wherein

at least one of: (1) electron mobility of said emissive polymer layer and (2) hole mobility of said emissive polymer layer is reduced until a recombination zone is sufficiently far from a cathode so that quenching of emitted light is minimized and said recombination zone is sufficiently far from an interface between a hole transporting layer and said emissive polymer layer so that at least one of: device lifetime and efficiency is improved.

21. The method of claim 19 further comprising

insignificantly changing hole mobility of said emissive polymer layer if only said portion of electrons are trapped; and

insignificantly changing electron mobility of said emissive polymer layer if only said portion of holes are trapped.

22. The method of claim 19 further comprising

recombining at least most of said plurality of electrons and said plurality of holes at a plurality of host components of said emissive polymer layer if only said portion of electrons are trapped or only said portion of holes are trapped.

23. The method of claim 19 further comprising

recombining at least some of said plurality of electrons and said plurality of holes at a plurality of electron/hole traps if said plurality of electron/hole traps trap at least some of said portion of electrons and said portion of holes.

24. An organic light emitting diode ("OLED") device, comprising:

a substrate;

an anode on said substrate;

a hole transporting layer on said anode;

an emissive polymer layer on said hole transporting layer; and

a cathode on said emissive polymer layer,

wherein said emissive polymer layer includes

a plurality of host components; and

at least one of: (1) a plurality of hole traps, (2) a plurality of electron traps, and (3) a plurality of electron/hole traps,

wherein said plurality of electron traps reduce electron mobility within said emissive polymer layer, said plurality of hole traps reduce hole mobility within said emissive polymer layer, and said plurality of electron/hole traps reduce electron mobility and hole mobility within said emissive polymer layer.

25. The OLED device of claim 24 wherein

at least one of: (1) said electron mobility of said emissive polymer layer and (2) said hole mobility of said emissive polymer layer is reduced until a recombination zone is sufficiently far from a cathode so that quenching of emitted light is minimized and said recombination zone is sufficiently far from an interface between said hole transporting layer and said emissive polymer layer so that at least one of: device lifetime and efficiency is improved.

26. The OLED device of claim 24 wherein said emissive polymer layer emits visible light wherein said visible light is primarily due to recombinations at said plurality of host components if said emissive polymer layer includes either a plurality of hole traps, or a plurality of electron traps.

27. The OLED device of claim 24 wherein said emissive polymer layer emits visible light, wherein some of said visible light is due to recombinations at said plurality of electron/hole traps if said emissive polymer layer includes electron/hole traps.

28. The OLED device of claim 24 wherein said device is any one of: an OLED pixel or an OLED light source element.